IFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPEAL BRIEF FOR THE APPELLANT

Ex parte LENELL

APPARATUS FOR ETHERNET PHY/MAC COMMUNICATION

Serial No. 09/539,602
Appeal No.:
Group Art Unit: 2665

Enclosed is a check in the amount of Three Hundred Forty Dollars ($340.00) to cover the official fee for this Appeal Brief. In the event that there may be any fees due with respect to the filing of this paper, please charge Deposit Account No. 50-2222.

William F. Nixon
Attorney for Appellant(s)
Reg. No. 44,262

SQUIRE, SANDERS & DEMPSEY LLP
8000 Towers Crescent Drive, 14th Floor
Tysons Corner, VA 22182-2700

Atty. Docket: 58268-00143

WFN/cct

Encls: Check No. 012825
Appeal Brief (in triplicate)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Appellant:

John K. LENELL — Appeal No.:

Serial Number: 09/539,602 — Group Art Unit: 2665

Filed: March 31, 2000 — Office Action: Justin M. Philpott

For: APPARATUS FOR ETHERNET PHY/MAC COMMUNICATION

BRIEF ON APPEAL

I. INTRODUCTION

This is an appeal from the final rejection set forth in an Official Action dated November 30, 2004, finally rejecting claims 1-23, all of the claims pending in this application. A Response under 37 CFR § 1.116 was timely filed on February 2, 2005. A Notice of Appeal was timely filed on February 28, 2005, 2005, with an appropriate petition for Extension of Time. This Appeal Brief is being timely filed.

II. REAL PARTY IN INTEREST

The real party in interest in this application is Broadcom Corporation, 16215 Alton Parkway, Irvine, California 92618-3616. An assignment from the Inventor to Broadcom Corporation was recorded by the United States Patent and Trademark Office on June 28, 2000, at reel 010933, frame 0517.

III. STATEMENT OF RELATED APPEALS AND INTERFERENCES

There are no known related appeals and/or interferences which will directly effect or be directly effected by or have a bearing on the Board's decision in this appeal.

IV. STATUS OF CLAIMS

Claims 1-23, all of the claims pending in the present application, are rejected as being unpatentable over certain prior art. Specifically, claims 1, 2, 4-7, 9-11, 15 and 18-23 were rejected as being unpatentable under 35 U.S.C. 103(a) over applicant's admitted prior art (AAPA) in view pages 112-114 and 170-174 of "Detailed Guide to Fast Ethernet" by H.W. Johnson (hereinafter Johnson), and further in view of U.S. Patent No. 6,636,140 to Lee et al. (hereinafter Lee). Claims 3, 8, 12-14, 16 and 17 were rejected as being unpatentable under 35 U.S.C. § 103(a) over the AAPA in view of Johnson, further in view of Lee, and further in view of U.S. Patent No. 5,809,026 to Wong et al. (hereinafter Wong).

V. STATUS OF AMENDMENTS

Claims 1-23 were filed with the original application on March 31, 2000. An Office Action was mailed on May 24, 2004, that rejected claims 1-23. Claims 1, 4, and 15 were amended in a Response filed on August 24, 2004. An Office Action

was mailed on November 30, 2004, that maintained the rejection of claims 1-23, and made the rejections final. Claims 1 and 15 were amended in a Response after Final Rejection filed February 2, 2005. An Advisory Action was mailed on February 16, 2005, that upheld the final rejections and indicated that the amendments in the Response filed February 2, 2005, would be entered upon the filing of an Appeal. Claims 1-23 are shown in Appendix 1.

VI. SUMMARY OF THE INVENTION

The invention relates to an apparatus for Ethernet transceiver/media access controller communication. A packet-based Layer 2 switch may include fundamental components such as physical layer transceivers (PHY), media access controllers (MAC), an address management unit, a packet switching fabric, random access memory and the like. A Layer 2 switch also resolves the destination of frames received at an ingress port by building a table of destination addresses and an associated egress port. Specification, page 5, lines 3-5. An Ethernet destination address typically is a 48-bit value, and the process of building a direct mapping for each possible address could require 2^{48} memory locations. Recognizing that only a small number of the 2^{48} addresses may be used, the memory required to store the addresses may be reduced to minimize the probability of an address search miss. Specification, page 5, line 8-11.

For example, referring to Figure 1, a packet-based multi-port switch 1 is

shown that includes in integrated switching controller 2 and a memory 3 that is external to switching controller 2. Specification, page 6, lines 32-35. Packet Data Storage Tale (PDST) 4 is co-located with Address Resolution Table (ART) 5, such that Packet Data Storage Table 4 may share memory with ART 5. Specification, page 7, lines 3-6. By using shared memory structure 3, the device pin count may be reduced and system implementation costs may be lowered. Specification, page 7, lines 12-13. ARL table 5, however, may be used without a shared memory structure. If so, then ARL table 5 may be configured to use direct mapped memory or other types of memory structure. Specification, page 7, lines 24-32.

Referring to Figure 12, an example of a link partner capability register (LPCR) is shown. Communication device 301 of Figure 12 includes MAC 302 and PHY 321. Specification, page 20, lines 23-25. Device 301 is capable of communicating data packets with a link partner according to a selectable communication protocol. Specification, page 20, lines 26-28. Flow control functions 305 of MAC 302 can directly access the data in LPCR 325, which permits MAC 302 to operate integrally with PHY 321. Specification, page 21, lines 1-2. The integration of MAC 302 and PHY 321 in device 301 may eliminate the need for an external microprocessor or a dedicated transceiver access state machine.

VII. ISSUES

The issues on appeal are whether claims 1, 2, 4-7, 9-11, 15 and 18-23 are

unpatentable under 35 U.S.C. § 103(a) over the APAA in view of Johnson, and further in view of Lee, and whether claims 3, 8, 12-14, 16 and 17 are unpatentable under 35 U.S.C. § 103(a) over the APAA in view of Johnson, further in view of Lee, and further in view of Wong. As discussed below, Applicant urges that these rejections should be withdrawn, and this application passed to issue.

VIII. GROUPING OF CLAIMS

Applicant respectfully submits that each of claims 1-23 stands alone. In other words, each of the presently pending claims is patentable separately.

IX. APPELLANT'S ARGUMENTS

Applicant respectfully submits that each of pending claims 1-23 recites subject matter that is neither disclosed nor suggested by the APAA, Johnson, Lee and Wong, either alone or in combination. The arguments that follow are based largely on the arguments filed in response to the final Office Action, but also include arguments that were filed with respect to the response to the earlier Office Action.

Claims 1, 2, 4-7, 9-11, 15 and 18-23 Are Not Rendered Obvious

The Office Action rejected claims 1, 2, 4-7, 9-11, 15 and 18-23 under 35 U.S.C. § 103(a), alleging that these claims are unpatentable over the APAA in view of Johnson, and further in view of Lee. The rejection is traversed as being based

on references that fail to disclose or suggest all of the features of any of the presently pending claims.

Claim 1, upon which claims 2, 4-7 and 9-11 are dependent, recites a communication device. The communication device includes a transceiver communicating data packets with a link partner according to a selectable communication protocol. The transceiver has a data register. The data register receives data representative of the selectable communication protocol. The communication device also includes a media access controller adapted for use in a packet-based communication network and operably coupled with the transceiver. The media access controller directly accesses the data register for receiving data representative of the selectable communication protocol.

Claim 15, upon which claims 18-23 are dependent, recites a communication network. The communication network includes a transceiver communicating data packets through a communication network according to a selectable communication protocol. The transceiver has a transceiver controller controlling the selectable communication protocol of the communication network and a state data register storing data representative of a state of the selectable communication protocol. The communication network also includes a media access controller, operably coupled with a first communication system. The media access controller is integrably coupled with the transceiver. The media access controller directly accesses the state data register corresponding with the state data register in the

transceiver. The communication network also includes a link partner operably coupled with a second communication system. The link partner cooperates with the transceiver controller to select the selectable communication protocol. The communication network also includes a communication channel, operably coupling the transceiver with the link partner.

As discussed below, the references cited above, either alone or in combination, fail to disclose or suggest all of the features of any of the presently pending claims.

The AAPA relates to a prior art device employing multiple link partner capability registers per a media access controller/transceiver pair. Figure 10 of the AAPA is cited by the Office Action as describing a configuration where MAC 100 and PHY 120 communicate link partner capability data to each other by way of microprocessor 110. Figure 10 of the AAPA depicts a structure that implements autonegotiation using two link partner capability registers, with one register being situated in the PHY and another register being situated in the MAC. Specification, page 19, lines 23-26.

Microprocessor management interface 104 of Figure 10 is used to transfer link partner capability data 112 in link partner capability register 106 between flow control functions 102 of MAC 100 and microprocessor 110. Specification, page 19, lines 29-32. In particular, the link partner PAUSE capability is used by MAC flow control functions 102 to enable the PAUSE function within MAC 100. Specification,

page 19, lines 32-34. Microprocessor 110 bi-directionally communicates with serial management interface controller 122. Specification, page 19, line 34, to page 20, line 3. Controller 122 receives and places the link capability data via link partner capability register 124, typically using a link partner capability signal 114. Specification, page 20, lines 3-6. Autonegotiation controller 126 senses conditions on network channel 130, as well as input from another communication device, such as, for example, another transceiver 140, having autonegotiation controller 142. Specification, page 20, lines 8-11.

The AAPA also includes Figure 11, which shows controllers 210 and 222. Each controller 210 and 222 includes a state machine that facilitates the transfer of link partner capability data. Specification, page 20, lines 15-18.

Johnson relates to an adapter card that gathers status from a transceiver and controls the transceiver by using a management interface. The management interface specifies a set of 32 registers divided into four groups. Johnson, page 112, lines 15-16. The management data model of Johnson assumes that the registers reside in the transceiver (PHY). Johnson, page 112, lines 17-18. The interface allows the management entity, on the adapter side of the interface, to read and write to the registers. Johnson, page 112, lines 18-19. Table 3.2 of Johnson shows control registers 0 and 1. Johnson, page 113.

Every transceiver (PHY) implements its own set of registers. Johnson, page 114, line 1. Each transceiver also is assigned a PHY address. Johnson, page 114,

lines 1-2. Johnson also describes a dual transceiver configuration that includes an embedded transceiver, while the adapter provides a port that is connected to an external transceiver. Johnson, page 114, lines 5-10. Only one transceiver may be activated at any given time. Johnson, page 114, lines 12-13.

Johnson also describes using auto-negotiation as an installation feature. According to Johnson, auto-negotiation permits installation and configuration of one end of a network connection without knowing what will be installed at the far end. Johnson, page 170, lines 24-26. Before enabling data transmission on a link, the auto-negotiation algorithm exchanges information with the device at the far end. Johnson, page 171, lines 29-31. Each device advertises its capabilities and records the capabilities of the device at the far end during this exchange. Johnson, page 171, lines 31-33. By the end of the exchange, the devices have determined their common modes. Johnson, page 171, lines 36-37.

Lee relates to a system and method for a flexible MAC layer interface in a wireless local area network. Lee describes a MAC interface that operates with radios that fail to incorporate all transceiver functionality and with radios that do incorporate all transceiver functionality. Referring to Figure 3 of Lee, MAC device 32 communicates with radio 34 using a processor 36 and a transceiver interface 38. Lee, column 4, lines 31-32. Transceiver interface 38 provides four signal pins 40, 42, 44 and 46 to connect MAC device 32 to radio 34 and to transmit data from MAC device 32 to radio 34. Lee, column 4, lines 33-35. Referring to Figure 4 of

Lee, four signal pins 50, 52, 54 and 56 also are used during the receive mode between MAC device 32 and radio 34. Lee, column 4, lines 49-53.

MAC device 32 is configurable to operate in combination of transmit and receive modes. Lee, column 4, lines 65-67. Figure 5 of Lee illustrates the four transmit and receive modes. MAC device 32 of Figure 5 includes processor 36, transceiver interface 38, and static random access memory (SRAM) 60 for storing user data and flash random access memory (RAM) 62 for storing system programs. Lee, column 5, lines 12-15. Transceiver interface 38 includes a register set 64, a transmit first-in, first-out (fifo) queue 68, a state machine 70, a parallel-to-serial shift-register 72, a serial fifo 74 and a serial-to-parallel shift-register 75. Lee, column 5, lines 17-21.

The functionality of state machine 70 is dependent on the settings of register set 64. Lee, column 5, lines 23-25. Processor 36 places state machine 70 in a particular transmit and receive mode by altering the settings of register set 64. Lee, column 5, lines 26-28. More specifically, upon boot-up processor 36 fetches and executes instructions from the flash memory. Lee, column 5, lines 29-30. In response to the instructions, processor 36 initializes register set 64, including and tx_mac_only register bit 76 and a rx_mac_only register bit 78 in order to set the mode of MAC device 32.

Applicant submits that a *prima facie* case of obviousness has not been established by the Office Action with regard to the presently pending claims. To

establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations. MPEP §2142. Applicant submits that a *prima facie* case of obviousness has not been established with regard to claims 1, 2, 4-7, 9-11, 15 and 18-23.

Referring to the AAPA, media access controller 100 is linked to transceiver 120 via microprocessor 110. Media access controller 100 of the AAPA is not directly accessing register 124 of the AAPA. Instead, controller 122 gets and puts the link capability data via register 124, using a link partner capability signal 114. Media access controller 100 is not involved in this operation. Referring to Figure 11 of the AAPA, a state machine not in PHY 220 facilitates the transfer of link partner capability data between PHY 220 and MAC 200. Thus, MAC 100 or 200 of the AAPA fails to disclose or suggest directly accessing a data register within PHY 220. Further, applicant notes that the Office Action states that the AAPA "may not specifically disclose a selectable communication protocol [being] controlled by the controller and that the MAC directly accesses the data register and is integrally coupled with the PHY." Office Action, page 3, 20-22. Therefore, the AAPA fails to disclose or suggest at least these features of the presently pending claims.

Applicant submits that Johnson, either alone or in combination with the AAPA and Lee, also fails to disclose or suggest all the features of the pending claims. The Office Action alleges that Johnson teaches a communication network having a transceiver PHY and a media access controller MAC, and also teaches a selectable communication protocol implicitly controlled by a controller. Office Action, page 3, line 23, to page 4, line 2. The Office Action also states that the registers reside in the PHY of Johnson, rather than the MAC, and that the MAC is integrally coupled with the PHY. Office Action, page 4, lines 2-4. Applicant notes that the Office Action, however, states that Johnson does not provide all the features of the claims missing from the AAPA, or "Johnson may not specifically disclose the MAC directly accesses the data register." Office Action, page 4, lines 11-12. Therefore, applicant submits that Johnson, either alone or in combination with the AAPA, fails to disclose or suggest at least these features of the presently pending claims.

Lee was cited by the Office Action as teaching an improvement for a MAC interface and that the MAC directly accesses a data register. Office Action, page 4, lines 13-16. Thus, the Office Action alleges that the teachings of Lee provides an improvement for a MAC interface wherein the device is able to communicate both with radios incorporating such functionality to generate PHY data and with radios not incorporating such functionality to provide compatibility between MAC devices and physical devices having different proctols. Applicant disagrees that

Lee cures the deficiencies of the AAPA and Johnson, and respectfully submits that Lee, either alone or in combination with the AAPA and Johnson, fails to disclose or suggest the patentable features described above.

Referring to Lee, processor 36 initializes register set 64, as shown in Figures 5A and 5B. Register set 64, which includes bits 76 and 78, controls the functionality of state machine 70. Lee, column 5, lines 23-25. Applicant submits that register set 64 of Lee fails to disclose or suggest a data register being directly accessed by the MAC for data representative of the selectable communication protocol. Processor 36 places state machine 70 in a particular transmit and receive mode by altering the settings of register set 64. State machine 70, as discussed above, may be in one of four modes for transmitting and receiving, and the selected mode is according to the status of register set 64. Applicant submits that register set 64 is not accessed for receiving data representative of a selectable communication protocol.

Further, still referring to Figures 5A and 5B, register set 64 is within transceiver interface 38, and not in radio 34. Applicant submits that radio 34 and transceiver interface 38 are not the same elements in Figures 5A and 5B, and, therefore, processor 36 or MAC device 32 does not directly access a register on radio 34 to receive data representative of a selectable communication protocol.

In contrast, claim 1, for example, recites "the PHY having a data register" and "the media access controller directly accessing the data register for receiving

data representative of the selectable communication protocol." Claim 15 recites "the PHY having . . . a state data register storing data representative of a state of the selectable communication protocol" and "the MAC directly accessing the state data register corresponding with the state data register in the PHY." Applicant submits that Lee does not disclose or suggest at least these features of the claims that are acknowledged by the Office Action as not being taught by the AAPA and Johnson. Referring to Figure 12 of the present application, media access controller 302 directly accesses link partner capability register, or LPCR, 325. This features permits MAC 302 to operate integrally with PHY 321. Specification, page 21, lines 1-3. This integration of media access controller 302 and PHY 321 may eliminate the need for an external microprocessor or a dedicated transceiver state machine, such as state machine 70 described in Lee. Specification, page 21, lines 3-6.

In the Advisory Action dated February 16, 2005, the final rejection was maintained. The Advisory Action stated that applicant's arguments presented in the Response filed February 2, 2005, were not persuasive because a previous Office Action relied upon the teaching of Johnson for "receiving data representative of a selectable communication protocol." Advisory Action, page 2, lines 3-6. Applicant submits that the Examiner misinterpreted the arguments presented in the Response, where applicant argued that none of the cited references, including Johnson and Lee, disclose or suggest the media access controller directly

accessing the data register for receiving data representative of the selectable communication protocol. Even if the assertion within the Advisory Action were held to be true, which applicant does not admit, the above feature of the claims still is not addressed by the teachings of the cited references. For example, register set 64 in Lee is not directly accessed by the MAC for data representative of a selectable communication protocol. Instead, register set 64 is accessed by state machine 70.

Further, the Advisory Action states "applicant argues that Lee does not disclose the register is within a transceiver." Advisory Action, page 2, line 11. The Advisory Action then states that a previous Office Action relies upon the teachings of Johnson for "coupling registers within a transceiver." Advisory Action, page 2, lines 11-13. Applicant again submits that the Examiner misinterpreted applicant's arguments presented in the Response filed February 2, 2005. Applicant, referring to page 13, lines 4-12, of the Response, notes that the Office Action dated November 30, 2004, refers to MAC 32 of Lee as accessing register set 64 to teach directly accessing a data register within the PHY. Office Action, page 4, lines 13-16. Applicant merely was bringing to the Examiner's attention that register set 64 is not located within radio 34. Applicant submits that relying on the reasoning put forth in the Office Action that Lee taught the features described above are improper.

"To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." In re Royka, 490 F.2d 1882, 1385, 165 USPQ 580 (CCPA 1974); MPEP § 2143.03. "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970); MPEP § 2143.03. Applicant submits that the Advisory Action fails to take into account the claimed feature of the MAC directly accessing the data register within the PHY, which was also argued in the previous Responses. Thus, applicant submits that Lee fails to disclose or suggest the features missing from the AAPA and Johnson.

With respect to dependent claims 2, 4-7, 9-11, 15 and 18-23, applicant submits that claims 2, 4-7 and 9-11 depend on and incorporate all the features of claim 1, and that claims 18-23 depend on and incorporate all the features of claim 15. Thus, the arguments above relating to claims 1 and 15 are applicable to claims 2, 4-7, 9-11, 15 and 18-23. Applicant respectfully submits that these dependent claims are also allowable over the cited reference because of the reasons provided above and the additional reasons provided below.

With regard to claim 2, applicant submits that this claim includes all the features of claim 1 discussed above as well as the additional features of the PHY being integrally coupled with the MAC. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim

2. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 2.

With regard to claim 4, applicant submits that this claim includes all the features of claim 1 discussed above as well as the additional features of the selectable communication protocol being a protocol defined by an IEEE standard 802.3 communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 4. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 4.

With regard to claim 5, applicant submits that this claim includes all the features of claims 1 and 4 discussed above as well as the additional features of the IEEE Standard 802.3 protocol including a 10Base-T communication protocol and a 100Base-T communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 5. For example, the cited references fail to disclose or suggest at least the feature

of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 5.

With regard to claim 6, applicant submits that this claim includes all the features of claims 1, 4 and 5 discussed above as well as the additional features of the 100Base-T communication protocol including a 100Base-T4 communication protocol, a 100Base-TX communication protocol, a 100Base-FX communication protocol, and a 100Base-T2 communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 6. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 6.

With regard to claim 7, applicant submits that this claim includes all the features of claims 1, 4 and 5 as well as the additional features of the IEEE Standard 802.3 protocol being one of a full-duplex communication protocol and a half-duplex communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 7. For example, the cited references fail to disclose or suggest at least the feature of "the

PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 7.

With regard to claim 9, applicant submits that this claim includes all the features of claims 1, 4 and 5 as well as the additional features of the IEEE Standard 802.3 communication protocol including an autonegotiation communication protocol, and wherein the device further includes an autonegotiation controller, operably coupled to the data register, the autonegotiation controller selecting the selectable communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 9. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 9.

With regard to claim 10, applicant submits that this claim includes all the features of claims 1, 4, 5 and 9 discussed above as well as the additional features of the data representative of the selectable communication protocol including autonegotiation state data. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 10. For

example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 10.

With regard to claim 11, applicant submits that this claim includes all the features of claims 1, 4, 5, 9 and 10 discussed above as well as the additional features of the data register being a link partner capability register. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 11. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 11.

Claims 18- 23 depend directly or indirectly from claim 17, which is discussed below. Therefore, claims 18-23 will be addressed in conjunction with discussion of claim 17 below.

In addition, if an independent claim is nonobvious under 35 U.S.C. § 103(a), then any claim dependent therefrom is nonobvious. MPEP § 2143.03. Because the cited references fail to render obvious independent claims 1 and 15, the cited references also fail to render obvious all the features of claims 2, 4-7, 9-11, 15 and

18-23. Thus, applicant respectfully submits that claims 1, 2, 4-78, 9-11, 15 and 18-23 are allowable.

For at least the reasons provided above, applicant respectfully submits that the obviousness rejection of claims 1, 2, 4-7, 9-11, 15 and 18-23 is improper and must be withdrawn. Applicant respectfully requests that the final rejection of claims 1, 2, 4-7, 9-11, 15 and 18-23 be reversed and these claims be allowed.

Claims 3, 8, 12-14, 16 and 17 Are Not Rendered Obvious

Claims 3, 8, 12-14, 16 and 17 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the AAPA in view of Johnson, further in view of Lee, and further in view of Wong. The Office Action took the position that the AAPA, Johnson and Lee taught all the elements of these claims except that "the PHY and MAC are integrated on a monolithic VLSI component." Office Action, page 6, lines 15-16. Wong was cited as providing those features missing from claims 3, 8, 12-14, 16 and 17. Applicant respectfully traverses the obviousness rejection of claims 3, 8, 12-14, 16 and 17 and submits that the cited references of the AAPA, Johnson, Lee and Wong, either alone or in combination, fail to disclose or suggest all the features of any of the presently pending claims.

Claim 3 depends indirectly from claim 1. Applicant submits that claim 3 includes all the features of claim 1, and includes the additional features of the PHY and the MAC being integrated on a monolithic VLSI component.

Claim 8, upon which claims 12-14 are dependent, depends indirectly from claim 1. Applicant submits that claim 8 includes all the features of claim 1, and also includes the additional features of the PHY and the MAC being integrally coupled on a monolithic VLSi component.

Claim 16, upon which claim 17 is dependent, depends directly from claim 15. Applicant submits that claim 16 includes all the features of claim 15, and also includes the additional features of the PHY and the MAC being integrated on a monolithic VLSI component.

Wong relates to relates to a multi-port network interface. Wong describes a multi-port network interface that integrates a MAC, physical signalling and multiple PHYs onto a single chip. Wong, column 1, lines 47-50. Wong also describes a multi-port network interface device including a transmit data bus, a receive data bus, a medium access controller and a physical signalling circuit, coupled to transmit and receive data buses, and configured to interface to a network layer. Wong, column 2, lines 14-19. A receiver of Wong is configured to place data, received from the physical layer, on the received data bus for transmission to the network layer by the MAC and physical signalling circuit. Wong, column 2, lines 29-32. The MAC and physical signalling circuit of Wong is configured to place data on the transmit data bus for transmission to the physical layer by a transmitter. Wong, column 2, lines 32-35.

Applicant notes that claims 3, 8 and 12-14 depend from claim 1, and that claims 16 and 17 depend from claim 15. Therefore, claims 3, 8, 12-14, 16 and 17 include all of the features of claims 1 or 15. Applicant submits that Wong fails to address the features of claims 1 and 15 that are missing from the AAPA, Johnson, and Lee. Because the AAPA, Johnson and Lee, either alone or in combination, fail to disclose or suggest all the features of the parent claims, applicant submits that the dependent claims cannot be considered obvious in view of the same combination of references.

Applicant also submit that Wong, either alone or in combination with the AAPA, Johnson, and Lee, fails to disclose or suggest the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol. Applicant submits that Wong describes the media access controller being coupled to transmit and receive data buses. Wong, column 2, lines 16-17. Wong also describes the MAC being configured to interface to a network layer. Wong, column 2, lines 17-18. Applicant submits that the MAC of Wong does not directly access a data register within a transceiver during the interface operations, and also does not receive data representative of a selectable communication protocol. Applicant respectfully submits that Wong fails to disclose or suggest at least these features of the pending claims, and also fails to cure the deficiencies of the other cited references of the AAPA, Johnson, and Lee.

Therefore, claims 3, 8, 12-14, 16 and 17 are allowable over the cited references for at least these reasons and the additional reasons provided below.

With regard to claim 3, applicant submits that this claim includes all the features of claim 1 discussed above as well as the additional features of the PHY and the MAC being integrated on a monolithic VLSI component. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 3. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 3.

With regard to claim 8, applicant submits that this claim includes all the features of claims 1, 4 and 5 as discussed above as well as the additional features of the PHY and the MAC being integrally coupled on a monolithic VLSI component. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 8. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 8.

With regard to claim 12, applicant submits that this claim includes all the features of claims 1, 4, 5 and 8 as discussed above as well as the additional features of a plurality of PHY and a plurality of MAC, each PHY having a MAC uniquely corresponding therewith. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 12. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 12.

With regard to claim 13, applicant submits that this claim includes all the features of claims 1, 4, 5, 8 and 12 as discussed above as well as the additional features of the IEEE Standard 802.3 communication protocol including an autonegotiation communication protocol, and wherein the device further comprises an autonegotiation controller corresponding with each of the plurality of PHY, the autonegotiation controller being operably coupled to the data register, the autonegotiation controller selecting the selectable communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 13. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving

data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 13.

With regard to claim 14, applicant submits that this claim includes all the features of claims 1, 4, 5, 8, 12 and 13 as discussed above as well as the additional features of the data register being a link partner capability register. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 14. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having a data register" and "the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol." Thus, the cited references fail to disclose or suggest all the features of claim 14.

With regard to claim 16, applicant submits that this claim includes the features of claim 15 as discussed above as well as the additional features of the PHY and the MAC being integrated on a monolithic VLSI component. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 16. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having . . . a state data register storing data representative of a state of the selectable communication protocol" and "the MAC directly accessing the state data register corresponding with the state data register in the PHY." Thus, the cited references fail to disclose or suggest all the features of claim 16.

With regard to claim 17, applicant submits that this claim includes the features of claims 15 and 16 as discussed above as well as the additional features of the selectable communication protocol being a protocol defined by an IEEE Standard 802.3 communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 17. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having . . . a state data register storing data representative of a state of the selectable communication protocol" and "the MAC directly accessing the state data register corresponding with the state data register in the PHY." Thus, the cited references fail to disclose or suggest all the features of claim 17.

With regard to claim 18, applicant submits that this claim includes the features of claims 15, 16 and 17 as discussed above as well as the features of the IEEE Standard 802.3 protocol including a 10Base-T communication protocol and a 100Base-T communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 18. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having . . . a state data register storing data representative of a state of the selectable communication protocol" and "the MAC directly accessing the state data register corresponding with the state data register in the PHY." Thus, the cited references fail to disclose or suggest all the features of claim 18.

With regard to claim 19, applicant submits that this claim includes the features of claim 15, 16, 17 and 18 as discussed above as well as the features of the 100Base-T communication protocol including a 100Base-T4 communication protocol, a 100Base-TX communication protocol, a 100Base-FX communication protocol, and a 100Base-T2 communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 19. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having . . . a state data register storing data representative of a state of the selectable communication protocol" and "the MAC directly accessing the state data register corresponding with the state data register in the PHY." Thus, the cited references fail to disclose or suggest all the features of claim 19.

With regard to claim 20, applicant submits that this claim includes all the features of claims 15, 16, 17 and 18 as discussed above as well as the additional features of the IEEE Standard 802.3 protocol being one of a full-duplex communication protocol and a half-duplex communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 20. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having . . . a state data register storing data representative of a state of the selectable communication protocol" and "the MAC directly accessing the state data register corresponding with the

state data register in the PHY." Thus, the cited references fail to disclose or suggest all the features of claim 20.

With regard to claim 21, applicant submits that this claim includes all the features of claims 15, 16, 17 and 18 as discussed above as well as the additional features of the IEEE Standard 802.3 communication protocol including an autonegotiation communication protocol, and wherein the PHY controller further includes an autonegotiation controller, operably coupled to the data register, the autonegotiation controller selecting the selectable communication protocol. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 21. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having . . . a state data register storing data representative of a state of the selectable communication protocol" and "the MAC directly accessing the state data register corresponding with the state data register in the PHY." Thus, the cited references fail to disclose or suggest all the features of claim 21.

With regard to claim 22, applicant submits that this claim includes all the features of claims 15, 16 and 17 discussed above as well as the additional features of the data representative of the selectable communication protocol including autonegotiation state data. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 22. For example, the cited references fail to disclose or suggest at least the feature of "the

PHY having . . . a state data register storing data representative of a state of the selectable communication protocol" and "the MAC directly accessing the state data register corresponding with the state data register in the PHY." Thus, the cited references fail to disclose or suggest all the features of claim 22.

With regard to claim 23, applicant submits that this claim includes all the features of claims 15, 16, 17 and 22 discussed above as well as the additional features of the data register being a link partner capability register. Applicant submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claim 22. For example, the cited references fail to disclose or suggest at least the feature of "the PHY having . . . a state data register storing data representative of a state of the selectable communication protocol" and "the MAC directly accessing the state data register corresponding with the state data register in the PHY." Thus, the cited references fail to disclose or suggest all the features of claim 22.

Further, as noted above, claims 3, 8, 12-14, 16 and 17 depend directly or indirectly from independent claims 1 and 15. Applicant submits that because claims 1 and 15 are nonobvious, then claims 3, 8, 12-14, 16 and 17 are nonobvious. If an independent claim is nonobvious under 35 U.S.C. § 103(a), then any claim depending therefrom is nonobvious. MPEP § 2143.03. Thus, claims 3, 8, 12-14, 16 and 17 are nonobvious.

At least for these reasons, applicant respectfully submits that the cited references, either alone or in combination, fail to disclose or suggest all the features of claims 3, 8, 12-14, 16 and 17 and that the obviousness rejection of the claims is improper. Applicant respectfully requests that the final rejection of claims 3, 8, 12-14, 16 and 17 be reversed, and these claims allowed.

X. CONCLUSION

For all of the above noted reasons, applicant strongly submits that certain clear and patentable differences exist between the present invention as claimed in claims 1-23, and the cited references relied upon by the Office Action. Applicant further contends that these differences are more than sufficient to show that the present invention would not have been obvious to a person having ordinary skill in the art at the time the invention was made.

This final rejection being in error, therefore, applicant respectfully requests that this Honorable Board of Patent Appeals and Interferences reverse the Office Action's decision in this case regarding the rejection of claims 1-23, and indicate the allowability of all of pending claims 1-23.

In the event that this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees which may be due with respect to this paper may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

SQUIRE, SANDERS & DEMPSEY LLP

William F. Nixon
Attorney for Applicant
Registration No. 44,262

Atty. Docket No.: 58268.00143

8000 Towers Crescent Drive, 14th Floor
Tysons Corner, VA 22182-2700
Tel: (703) 720-7800
Fax (703) 720-7802

WFN:cct

Encls: Appendices 1 and 2

APPENDIX 1

CLAIMS ON APPEAL

1. A communication device, comprising:

a transceiver (PHY) communicating data packets with a link partner according to a selectable communication protocol, the PHY having a data register therewithin, the data register receiving data representative of the selectable communication protocol; and

a media access controller (MAC) adapted for use in a packet-based communication network and operably coupled with the transceiver, the media access controller directly accessing the data register for receiving data representative of the selectable communication protocol.

2. The communication device of claim 1, wherein the PHY is integrally coupled with the MAC.

3. The communication device of claim 2, wherein the PHY and the MAC are integrated on a monolithic VLSI component.

4. The communication device of claim 1, wherein the selectable communication protocol is a protocol defined by an IEEE Standard 802.3 communication protocol.

5. The communication device of claim 4, wherein the IEEE Standard 802.3 protocol includes a 10Base-T communication protocol and a 100Base-T communication protocol.

6. The communication device of claim 5, wherein the 100Base-T communication protocol includes a 100Base-T4 communication protocol, a 100Base-TX communication protocol, a 100Base-FX communication protocol, and a 100Base-T2 communication protocol.

7. The communication device of claim 5, wherein the IEEE Standard 802.3 protocol is one of a full-duplex communication protocol and a half-duplex communication protocol.

8. The communication device of claim 5, wherein the PHY and the MAC are integrally coupled on a monolithic VLSI component.

9. The communication device of claim 5, wherein the IEEE Standard 802.3 communication protocol includes an autonegotiation communication protocol, and wherein the device further comprises an autonegotiation controller, operably coupled to the data register, the autonegotiation controller selecting the selectable

communication protocol.

10. The communication device of claim 9, wherein the data representative of the selectable communication protocol include autonegotiation state data.

11. The communication device of claim 10, wherein the data register is a link partner capability register.

12. The communication device of claim 8, further comprising a plurality of PHY and a plurality of MAC, each PHY having a MAC uniquely corresponding therewith.

13. The communication device of claim 12, wherein the IEEE Standard 802.3 communication protocol includes an autonegotiation communication protocol, and wherein the device further comprises an autonegotiation controller corresponding with each of the plurality of PHY, the autonegotiation controller being operably coupled to the data register, the autonegotiation controller selecting the selectable communication protocol.

14. The communication device of claim 13, wherein the data register is a link partner capability register.

15. A communication network, comprising:

a transceiver (PHY) communicating data packets through a communication network according to a selectable communication protocol, the PHY having

a PHY controller controlling the selectable communication protocol of the communication network, and

a state data register storing data representative of a state of the selectable communication protocol;

a media access controller (MAC), operably coupled with a first communication system, the MAC being integrably coupled with the PHY, the MAC directly accessing the state data register corresponding with the state data register in the PHY;

a link partner operably coupled with a second communication system, the link partner cooperating with the PHY controller to select the selectable communication protocol; and

a communication channel, operably coupling the PHY with the link partner.

16. The communication network of claim 15, wherein the PHY and the MAC are integrated on a monolithic VLSI component.

17. The communication network of claim 16, wherein the selectable

communication protocol is a protocol defined by an IEEE Standard 802.3 communication protocol.

18. The communication network of claim 17, wherein the IEEE Standard 802.3 protocol includes a l0Base-T communication protocol and a l00Base-T communication protocol.

19. The communication network of claim 18, wherein the 100Base-T communication protocol includes a 100Base-T4 communication protocol, a 100Base-TX communication protocol, a 100Base-FX communication protocol, and a 100Base-T2 communication protocol.

20. The communication network of claim 18, wherein the IEEE Standard 802.3 protocol is one of a full-duplex communication protocol and a half-duplex communication protocol.

21. The communication network of claim 18, wherein the IEEE Standard 802.3 communication protocol includes an autonegotiation communication protocol, and wherein the PHY controller further comprises an autonegotiation controller, operably coupled to the data register, the autonegotiation controller selecting the selectable communication protocol.

22. The communication network of claim 17, wherein the data representative of the selectable communication protocol include autonegotiation state data.

23. The communication network of claim 22, wherein the data register is a link partner capability register.

APPENDIX 2

DRAWINGS OF APPLICATION SERIAL NO. 09/539,602

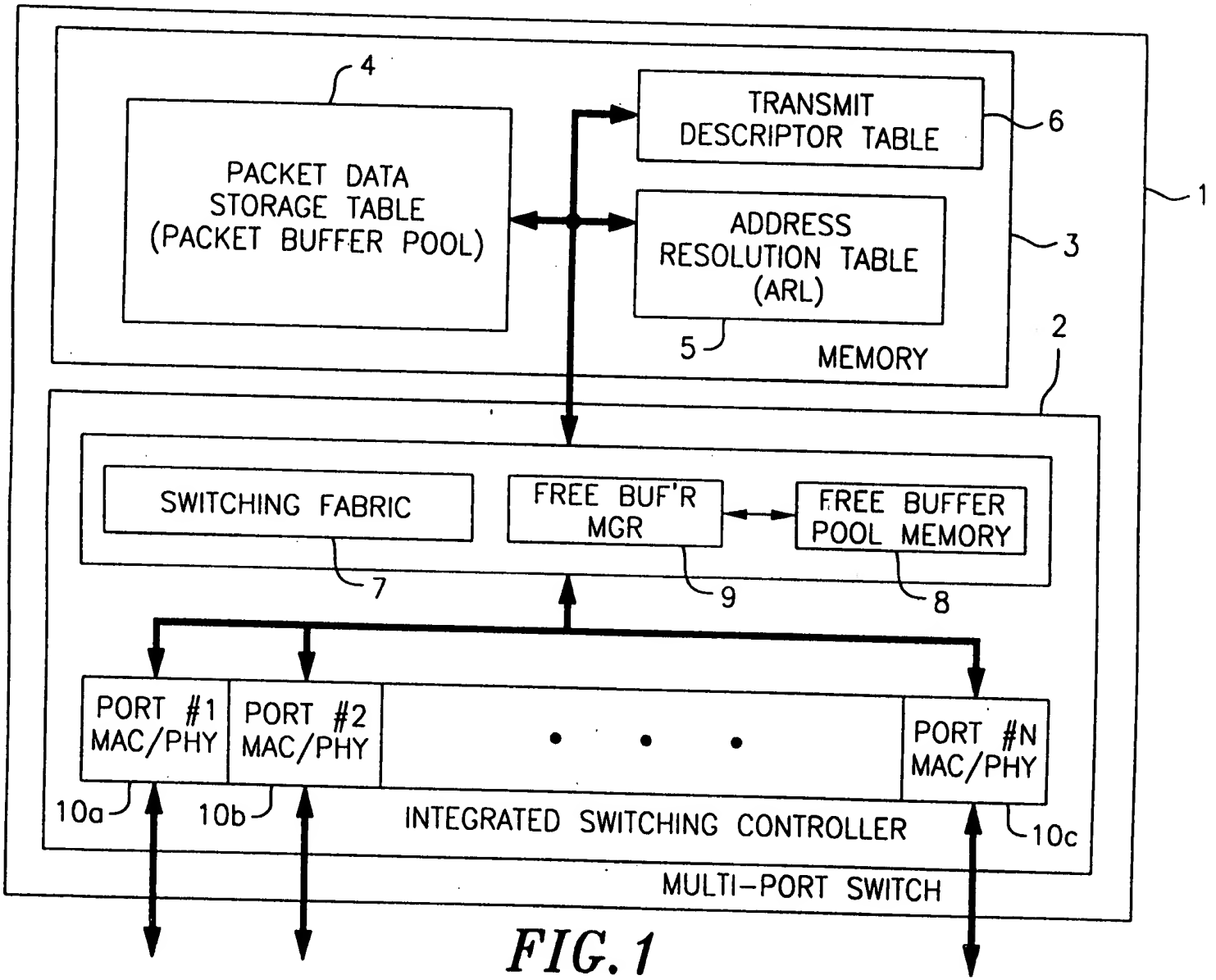


FIG. 1

FIG. 2

ADDRESS[7:0]	DATA[63:0]
00–CF	PACKET DATA
D0	PORT 0 TRANSMIT DESCRIPTOR
D1	PORT 1 TRANSMIT DESCRIPTOR
D2	PORT 2 TRANSMIT DESCRIPTOR
D3	PORT 3 TRANSMIT DESCRIPTOR
D4	PORT 4 TRANSMIT DESCRIPTOR
D5	PORT 5 TRANSMIT DESCRIPTOR
D6	PORT 6 TRANSMIT DESCRIPTOR
D7	PORT 7 TRANSMIT DESCRIPTOR
D8	PORT 8 TRANSMIT DESCRIPTOR
D9–DF	UNUSED
E0–FF	32 ARL TABLE ENTRIES

11, 12, 13, 14, 15, 16, 17, 18, 100

FIG. 3

ADDRESS[16:0]	DATA[63:0]
0000–00FF	MEMORY BLOCK 0
0000–01FF	MEMORY BLOCK 1
0000–02FF	MEMORY BLOCK 2
0000–FEFF	MEMORY BLOCK 3 TO 2046
0000–FFFF	MEMORY BLOCK 2047
0000–1FFFF	OPTIONAL MEMORY BLOCK 2048–4095

19, 20

FIG. 4

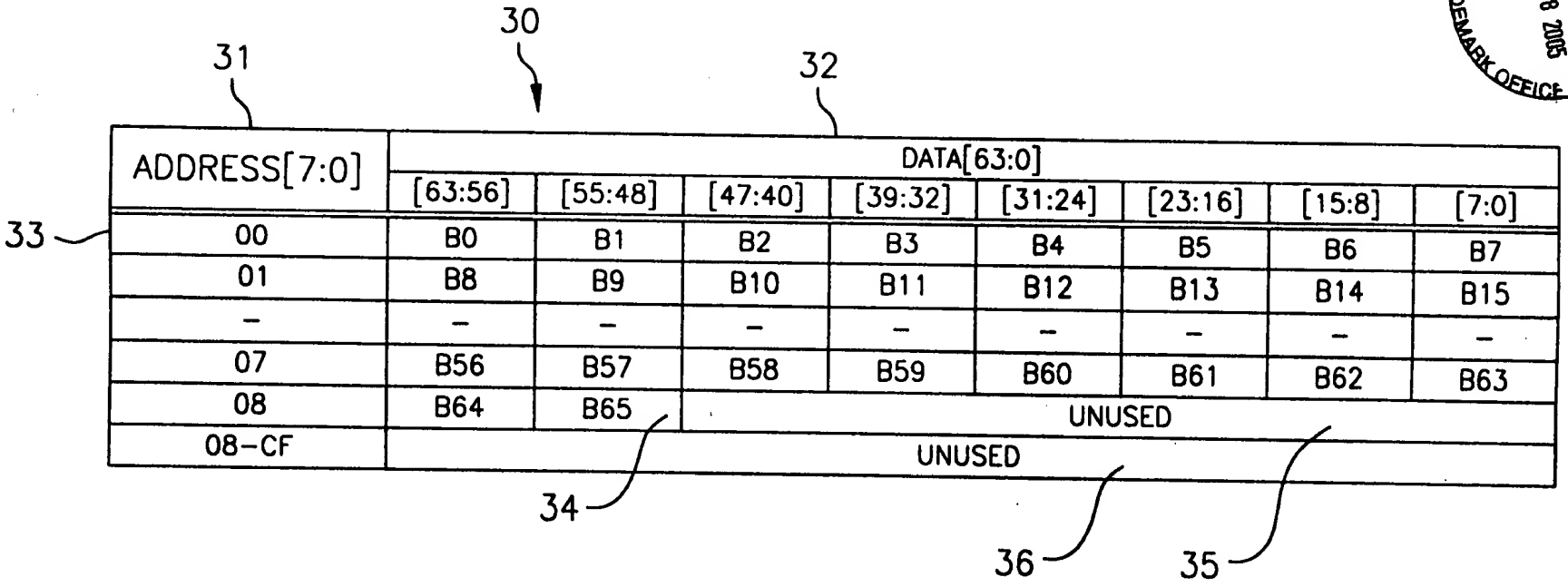


FIG.5

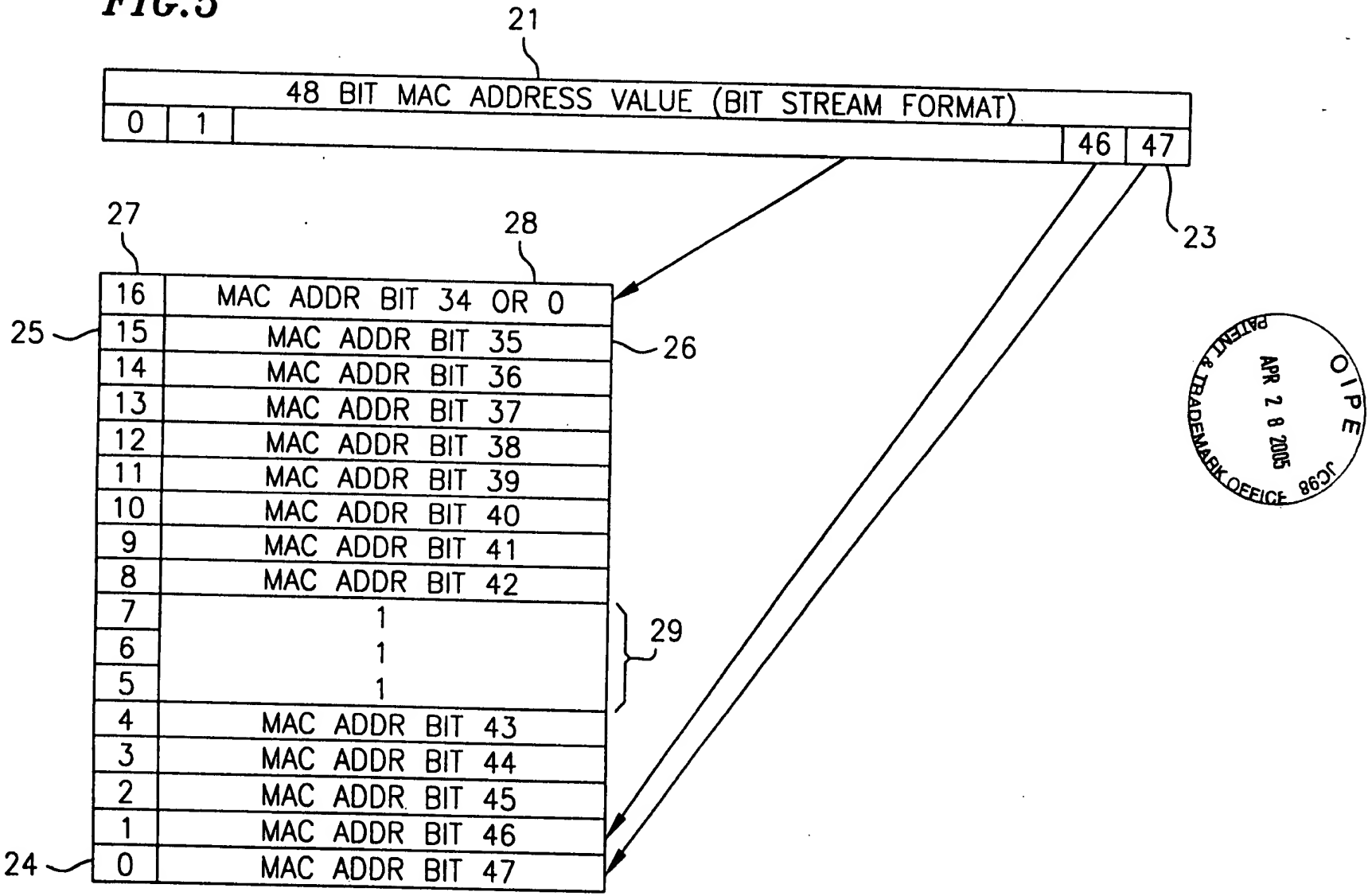
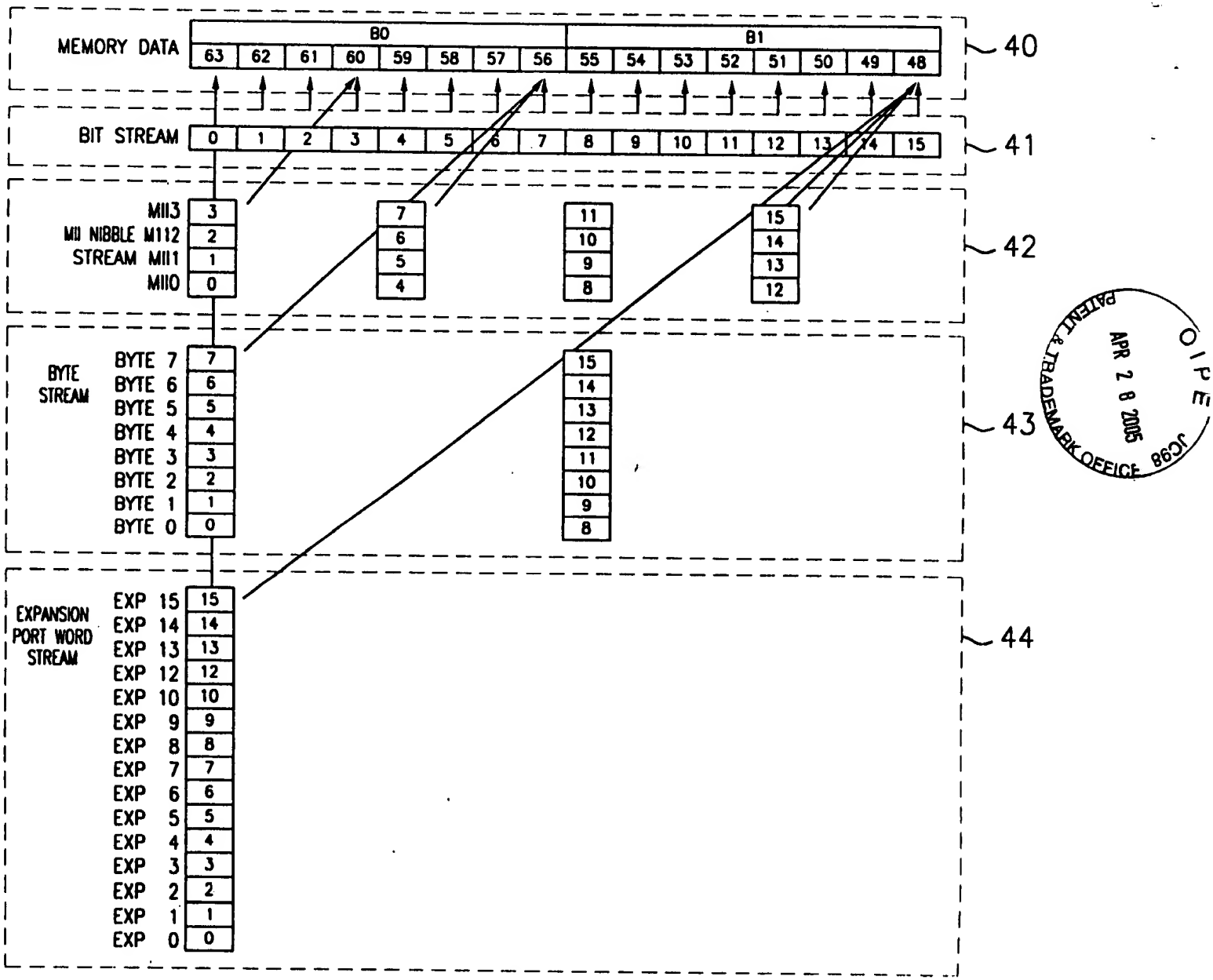


FIG.6



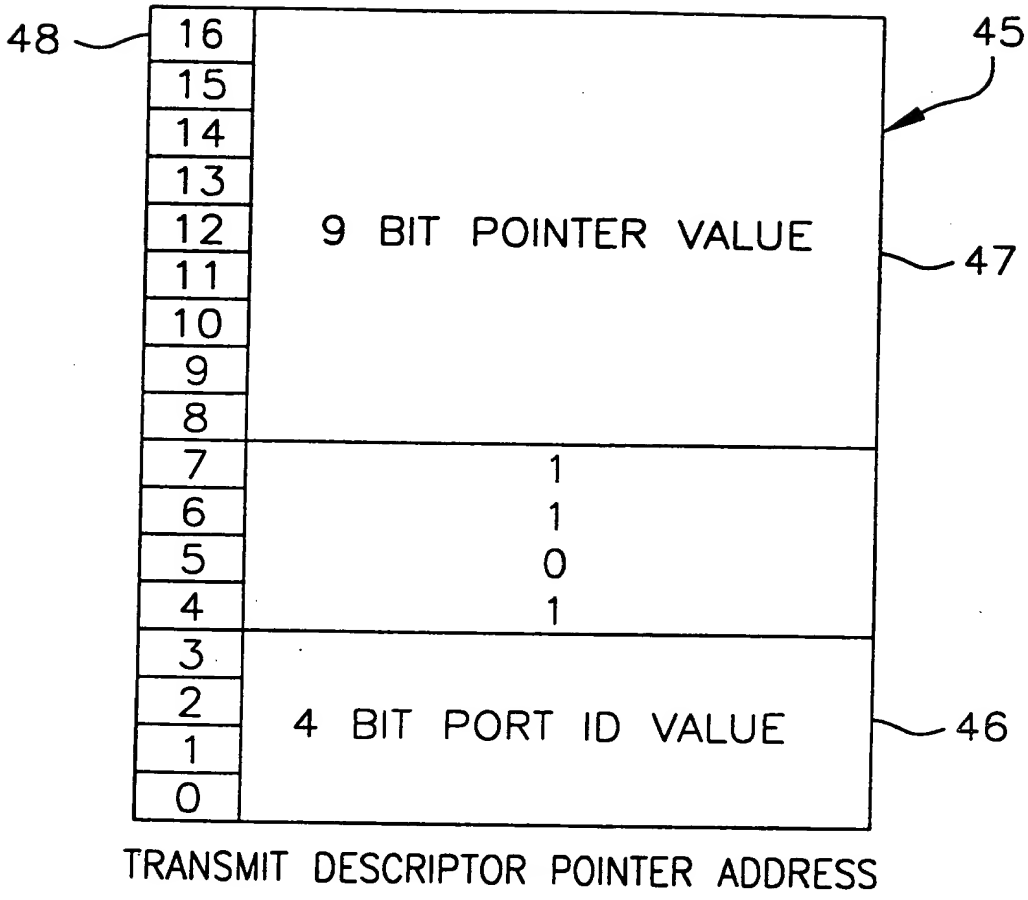
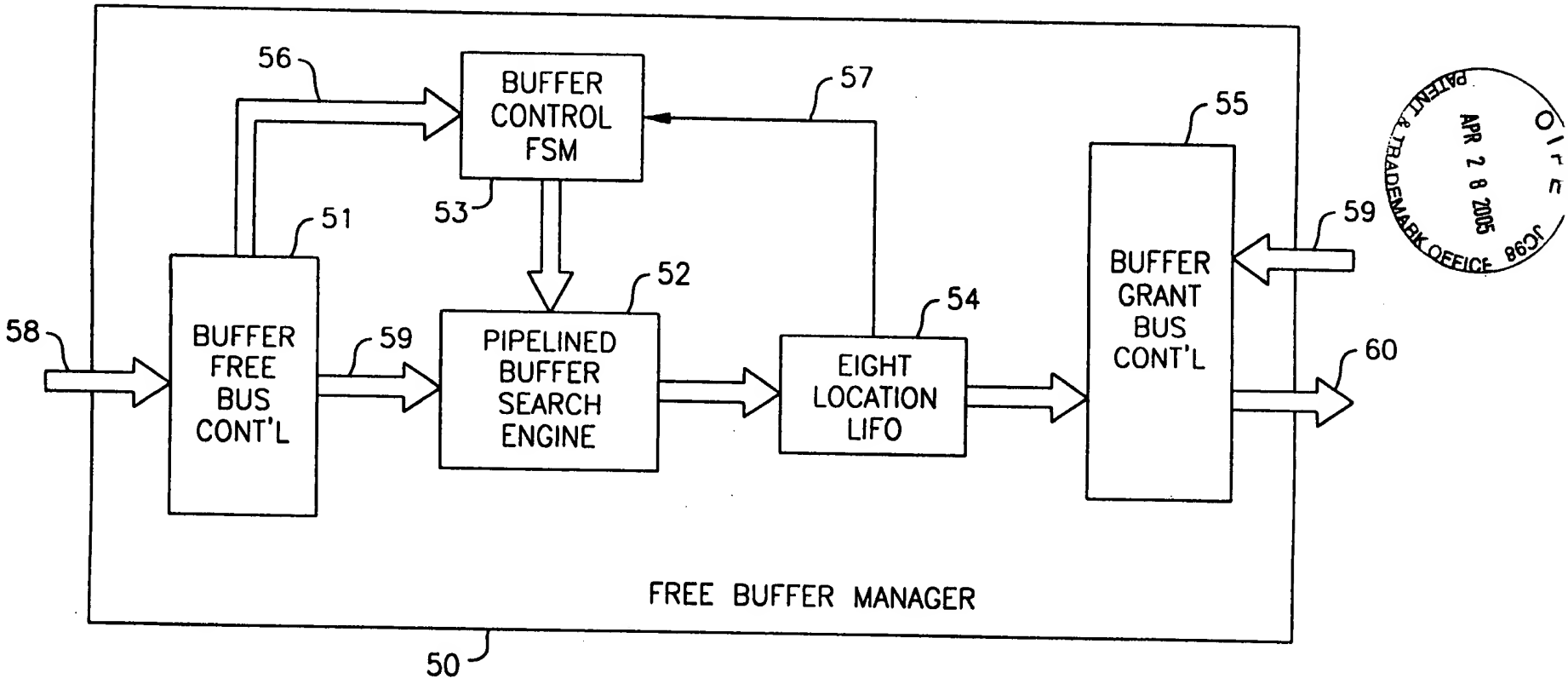


FIG. 7

FIG.8



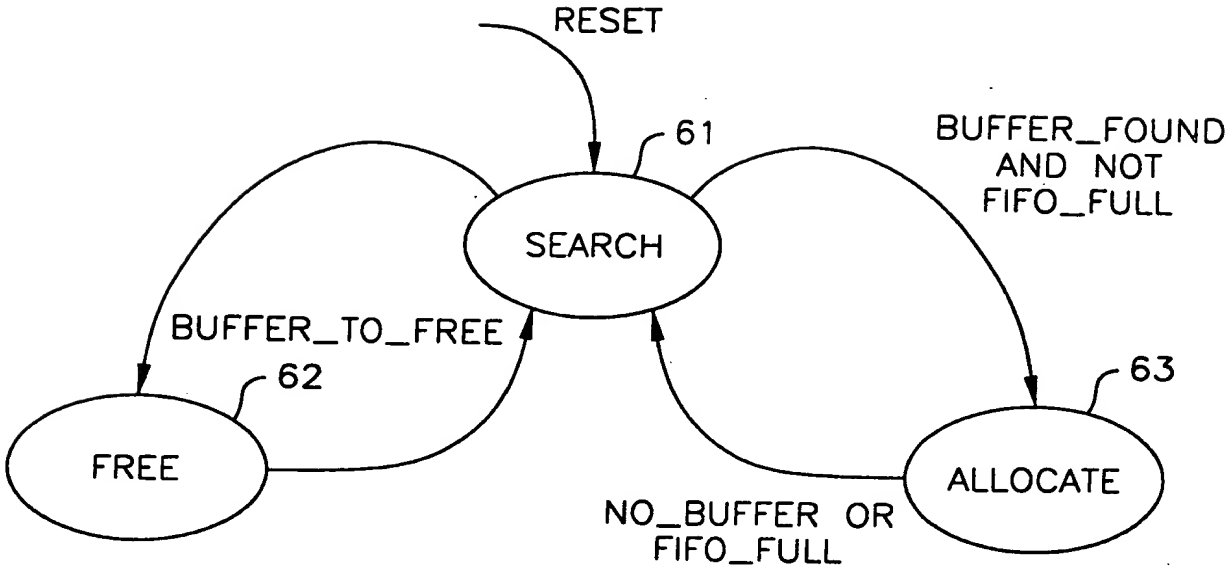


FIG. 9

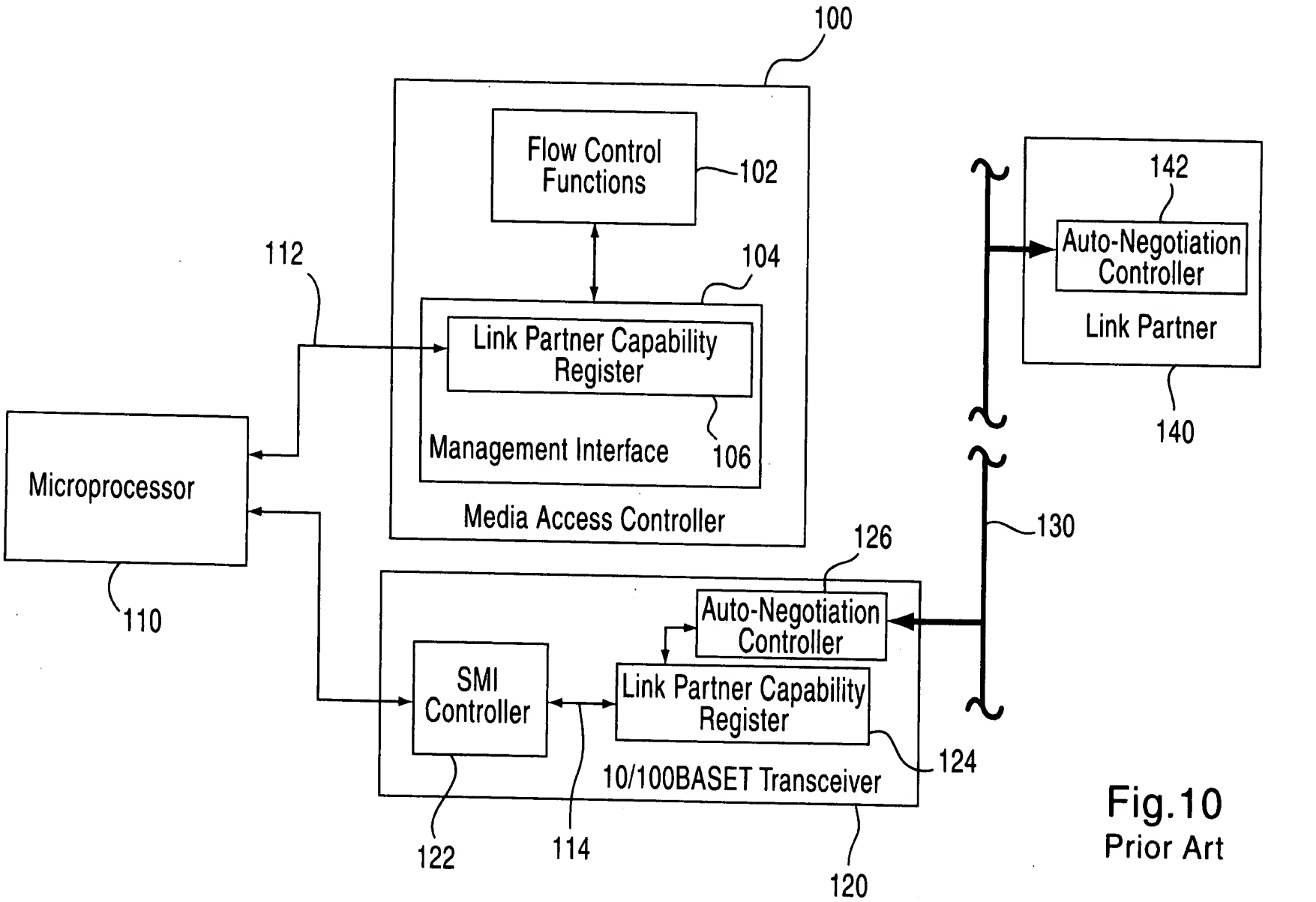
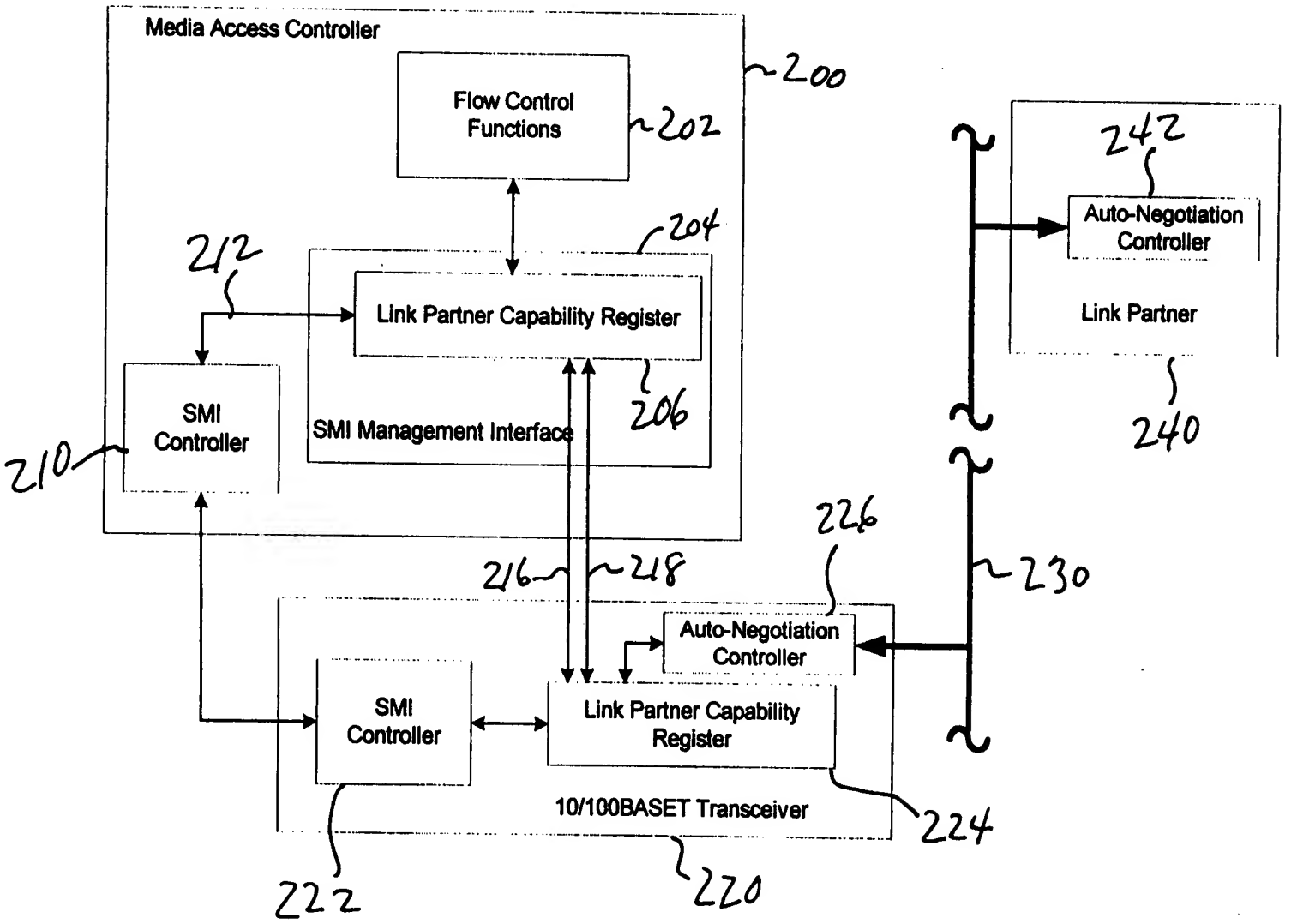


Fig.10
Prior Art



Prior Art

Figure 11

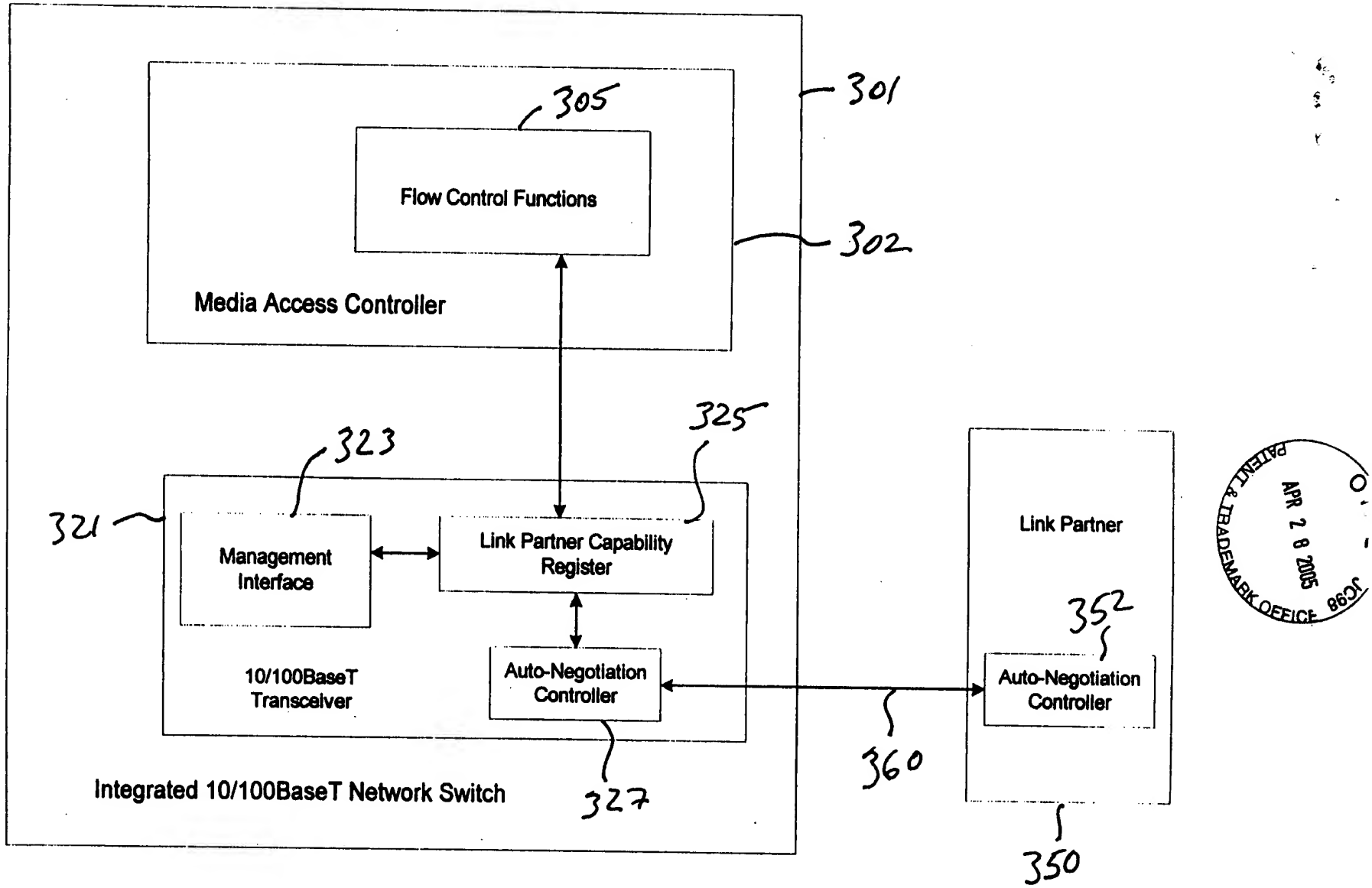


Figure 12

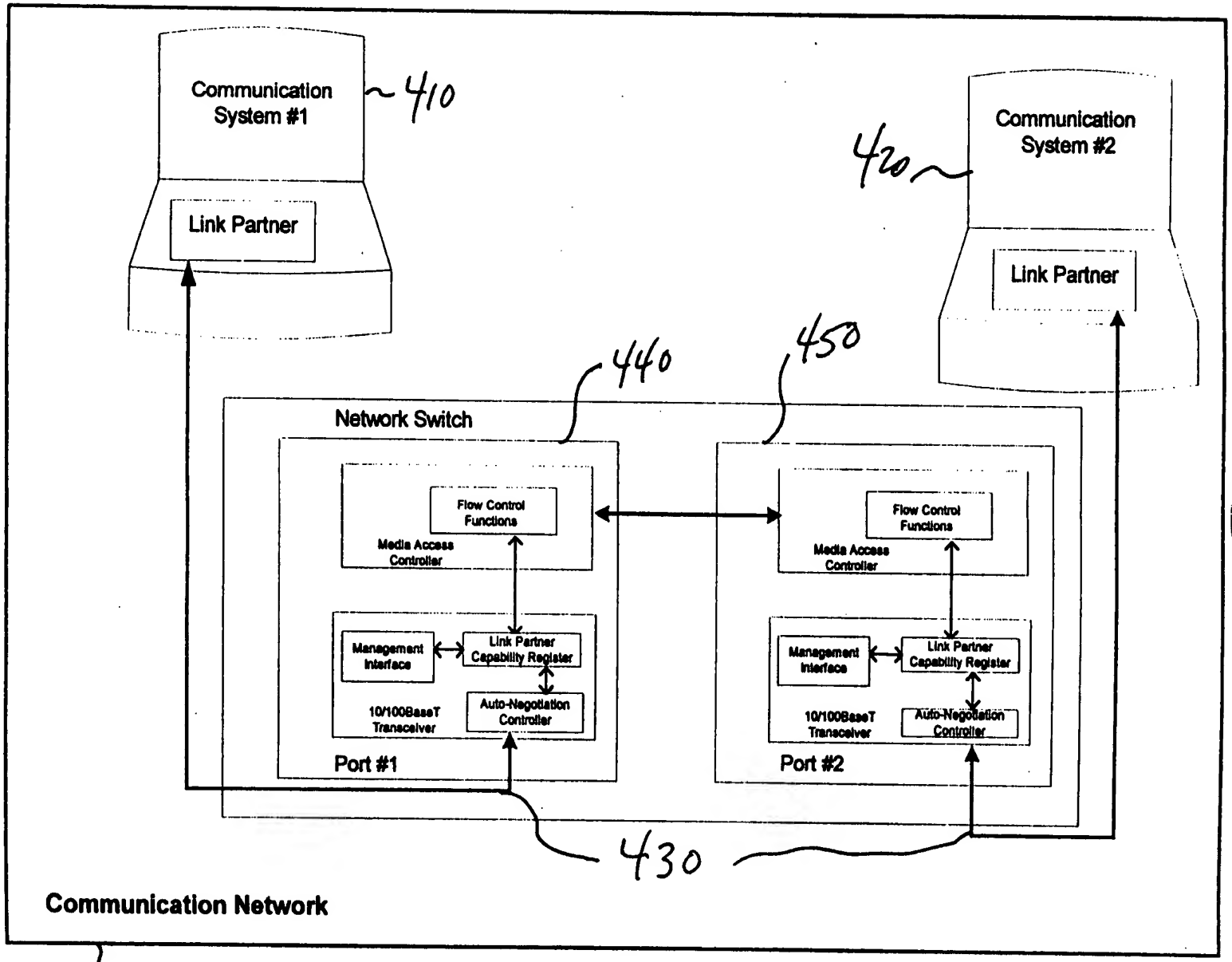


Figure 13